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PATENT APPLICATION TRANSMITTAL LETTER

The Assistant Commissioner
For Patents
Washington, D.C. 20231

Transmitted herewith for filing in the patent application of:

Jack O. CARTNER



For: MOWER HEAD WITH MOVABLE GUARD

Enclosed are:

[X] 12 sheets of specification.
[X] 1 sheet of Abstract.
[X] 6 sheets of claims.
[X] 7 sheets of drawings.
[X] Declaration and Power of Attorney.
[X] Small Entity Independent Inventor Statement
[X] Information Disclosure Statement and PTO-1449.

CLAIMS AS FILED

FOR	NO. FILED	NO. EXTRA	RATE	FEE
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BASIC FEE [] LARGE ENTITY \$690 [XX] SMALL ENTITY \$345				
TOTAL FILING FEE				\$ 390.00

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5 June 2000
Date

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Benjamin Trella

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF : Jack O. Cartner
FOR : MOWER HEAD WITH MOVABLE
GUARD
SERIAL NO. : Unknown
FILED : Herewith
ATTORNEY DOCKET NO. : CRT 2 0017

Cleveland, Ohio 44114-2518
May 4, 2000

**37 C.F.R. 1.27 STATEMENT OF STATUS
AS A SMALL ENTITY-INDEPENDENT INVENTOR**

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Dear Sir:

The undersigned Jack O. Cartner declares that he is an independent inventor of the invention described and claimed in the foregoing application; that (1) he has not assigned, granted, conveyed, or licensed and (2) he is under no obligation or contract or law to assign, grant, convey, or license, any rights in said invention to any person who could not likewise be classified as an independent inventor under 37 C.F.R. 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 C.F.R. 1.9(d) or a non-profit organization under 37 C.F.R. 1.9(e).

The undersigned acknowledges that he has a duty to file a notification of any change in status of this application and any patent(s) issuing therefrom which change results in a loss of entitlement to small entity status prior to, or at the time of paying, the earlier of the issue fee or any maintenance fee due after the date on which the small entity status is no longer appropriate.

The undersigned further declares that all statements made herein of his own knowledge are true and

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that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful and false statements may jeopardize the validity of the application or any patent issuing thereon.

By: 

Jack O. Cartner

Date: 6-1-00

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MOWER HEAD WITH MOVABLE GUARD

Background of the Invention

The present invention relates to a mower head. More particularly, the present invention relates to a mower head with a movable guard.

5 The invention finds particular application in conjunction with rotary brush and grass mowing and cutting apparatus for trimming highway medians and shoulders and will be described with particular reference thereto. It is to be appreciated, however, that the invention has other
10 applications including clearing saplings, small trees, brush, grass, and the like.

Heretofore, mowing heads have been mounted to tractors and other prime movers with various constructions including articulated arm assemblies and side arm assemblies.
15 The mower heads commonly include one or a plurality of rotating cutting blades which are housed within a shield structure. The shield typically includes an upper deck and a skirt which extends from the upper deck below the rotary cutting blades along all but the forward side of the mower
20 head. Various structures have been developed to allow grass and brush to pass under the forward side of the mower head into the path of the cutting blade but to inhibit other items

such as the limbs of the operator from passing into the path of the cutting blade. Such structures include a plurality of rake-like projections, a plurality of short lengths of chain, and the like.

5 Guarding the blades on a rotary cutter has always been a major problem. This is especially true when the cutter is attached to an extendible arm.

 Since it is not practical to build the carrier and boom arm of sufficient strength to push trees, etc. over so
10 that they can be cut, various configurations of detachable and hinge-type guards have been developed. Displacing the guard (the front portion of a mower housing) allows the operator to get the cutting blade close to the tree or brush to be cut in a manner similar to the way a skill saw or bench
15 grinder functions.

 Removing a straight front section of a rectangular or square mower housing, which acts as a guard, did not prove to be adequate. This construction provides a very limited cutting swath for the blades. Therefore, guards evolved
20 whereby the front section of the mower housing would retract out of the way. This construction was disadvantageous because no shield extended downwardly to prevent the blades from throwing foreign objects when the guard is in its normal position.

25 Another problem with the prior art mower heads is that it is difficult to pass heavier brush and saplings below

the shield into the cutting blade. Frequently, the mower heads are mounted with a breakaway mounting to enable them to yield upon encountering a stationary object, such as a fence post. The breakaway mounting tends to inhibit the operator
5 from urging the mower head against the heavier brush and saplings with progressively a greater force until they yield and pass into the cutting blade.

Brush clearing devices commonly have exposed, rotary cutting blades. In areas along roadways and the like
10 such devices are disadvantageous because people may be harmed by the cutting blade or objects thrown by the blade.

Accordingly, it is desirable to develop a new and improved mower head with a movable guard which would overcome the foregoing deficiencies and others while meeting the
15 above-stated needs and providing better and more advantageous overall results.

Summary of the Invention

The present invention relates to a new and improved mower head with a movable guard. More specifically, the
20 mower head comprises a deck having at least three sides and at least one side wall depending from the deck. At least one cutting blade is rotatably mounted to the deck on an axis extending through the deck. The deck is disposed above and generally parallel to the blade. The deck further comprises
25 a flap depending from one of the sides of the deck. Two of the deck sides are normal to each other and a third of the

deck sides is positioned at an acute angle in relation to the other two deck sides.

A guard assembly comprises an actuating member mounted on the deck, a guard attached to the pivotable arm
5 and pivotally attached via a hinge to the deck along two sides of the deck, and a flap which depends from the guard. The guard includes a first wall which comprises an approximately straight edge and a second wall which comprises a plurality of angled sections.

10 The actuating member comprises a hydraulic cylinder and a piston. The cylinder includes a chamber surrounding the piston. The actuating member is mounted on the deck at a location spaced from the hinge.

A top surface of the guard and a top surface of the
15 deck are located in the same plane.

In a second preferred embodiment, one of the deck sides can comprise a plurality of angled sections.

The guard has one wall comprising a plurality of angled sections which matingly interconnect with the angled
20 sections of the deck side and a second wall which comprises a plurality of angled sections.

The mower head can further comprise a fourth side and at least three side walls, one depending from three of the four sides. Two of the side walls are rigid. A third
25 side wall comprises a flap depending from one side of the deck.

In a third preferred embodiment, the top surface of the guard and the top surface of the deck are located in different planes.

One advantage of the present invention is the provision of a new and improved mower head.

Another advantage of the present invention is the provision of a mower head with a guard which is pivotably attached to the deck and provides protection for a cutting blade of the mower head.

Still another advantage of the present invention is the provision of a mower head with a guard pivotably attached by a hinge at an angle with respect to two other sides of the deck of the mower head to allow more of the blade to be exposed and allow easier access to trees, shrubs, etc. for cutting.

Yet another advantage of the present invention is the provision of a mower head with a flap extending from the guard to protect the cutting blade when the guard is in its normal down position.

A further advantage of the present invention is the provision of a mower head with a guard which can be installed either in front of an angled main deck or above the main deck. If it is installed above the mower main deck, the front end of the main deck can be varied in shape.

Still other benefits and advantages of the invention will become apparent to those skilled in the art

upon reading and understanding the following detailed description.

Brief Description of the Drawings

The invention may take form in certain components
5 and structures, preferred embodiments of which will be
illustrated in the accompanying drawings wherein:

FIGURE 1A is a top plan view of a prior art mower
head with a movable guard;

FIGURE 1B is a side elevational view of the prior
10 art mower head with a movable guard of **FIGURE 1A**;

FIGURE 2A is a top plan view of a second prior art
mower head with a movable guard;

FIGURE 2B is a side elevational view of the prior
art mower head with movable guard of **FIGURE 2A**;

15 **FIGURE 3A** is a top plan view of the mower head with
a movable guard according to a first preferred embodiment of
the present invention;

FIGURE 3B is a side elevational view of the mower
head of **FIGURE 3A**;

20 **FIGURE 4A** is a top plan view of the mower head with
a movable guard according to a second preferred embodiment of
the present invention;

FIGURE 4B is a side elevational view of the mower
head of **FIGURE 4A**;

25 **FIGURE 5A** is a top plan view of the mower head with
a movable guard according to a third preferred embodiment of

the present invention;

FIGURE 5B is a side elevational view of the mower head of **FIGURE 5A**; and

FIGURE 6 is a perspective view of the mower head with the guard in the open position according to the first preferred embodiment of the present invention.

Detailed Description of the Preferred Embodiments

Referring now to the drawings, wherein the showings are for purposes of illustrating preferred embodiments of this invention only and not for purposes of limiting same, **FIGURE 3A** shows a mower head **C** according to a first preferred embodiment of the present invention.

A mower includes a prime mover, such as a tractor (not shown), which is self-propelled to move at least in forward and rearward directions. An arm assembly (not shown) is operatively connected at one end with the prime mover and at the other end with the mower head. A positioning control means, such as a plurality of hydraulic cylinders, controls the position of the arm assembly relative to the prime mover and the mower head. In this manner, the position and orientation of the head is selectively variable. The arm assembly can be a boom assembly which includes at least two pivotally connected arms, one of which is pivotally connected with the prime mover and the other of which is pivotally connected with the mower head.

As shown in **FIGURES 1A** and **1B**, one known guard

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system **A** (U.S. Patent No. 4,445,312) comprises a deck **10**, with a guard **12** with a front surface **14** which is spring loaded by spring **16**. A blade **20** is positioned below the deck and is mounted to a motor **22**, via an axis extending through the deck. An opening **24** exposes the blade when the guard swings out of the way, against the bias of the springs pulling it into its down position. Another known design replaces the springs with a hydraulic actuation system. While both of these constructions allow the blades to be exposed in the front for cutting purposes, they provide a very limited cutting swath for the blades.

Another popular type of guard is a swinging guard. Referring to **FIGURES 2A** and **2B**, the swinging guard system **B** has a guard **30** which swings rearward above blades **32** and below a mower deck **34**, and it allows the cutter blades to contact the material to be cut through an opening **36**. The blades **32** are drivingly connected to a motor **38**. However, when the guard **B** is in the closed or forward position, there is nothing extending downward in a vertical direction to prevent the blades from throwing foreign objects.

Referring to **FIGURES 3A** and **3B**, the mower head **C** according to the present invention comprises a polygonal deck **50** having sides **52**, **54**, **56**, **58**, and **60**. The deck can be fabricated from metal. Side **54** is positioned at an acute angle with respect to sides **52** and **56**. Sides **52** and **60** are oriented approximately normal to each other. Similarly, side

58 is positioned approximately normal to each of sides 56 and 60.

Side walls depend from each side of the deck. More specifically, side wall 62 depends from side 56, side wall 64 depends from side 52, side wall 66 depends from side 60, and side wall 68 depends from side 58. In this embodiment, side walls 62, 66, and 68 are rigid. However, side wall 64 comprises a flap which is flexible and moves out of the way when cutting is performed. The flap can be made from rubber, cloth, or any other flexible material. It can also be comprised of short metal chains or another movable type of material.

A cutting blade 70 is rotatably mounted to the deck 50 on an axis 72 which extends through the deck. The deck 50 is disposed above and generally parallel to the blade 70.

A guard assembly 80 is attached to the mower head. The guard assembly comprises an actuating member 82 mounted on the deck 50. A guard 84 is pivotally attached to the deck along sides 52, 54 of the deck. A flap 86 which depends from the guard 84 extends in front of the blade 70.

The actuating member 82 can comprise a hydraulic cylinder 90 and a piston 92. The actuating member 82 is pivotally attached at its piston rod end to a flange 94 which is rigidly mounted to the guard 84. The actuating member 82 is pivotally attached at its cylinder end to a flange 96

which is rigidly mounted to the deck 50.

A motor 100, which can be a hydraulic motor, is drivingly connected to the cutting blade 70 through axis 72. The motor 100 is positioned on a top surface 102 of the deck 50. The motor 100 is connected with a source of fluid power by hydraulic lines (not shown) extending along an arm connected to the prime mover.

The guard 84 has a top surface 104 which, in this embodiment, is located in the same plane as the top surface 102 of the deck 50. A hinge 110 pivotally mounts the guard 84 to the deck 50. The guard 84 includes a first wall 120 which comprises an approximately straight edge 121 and a second wall 122 which comprises a plurality of angled sections 124, 126, 128, 130, 132, 134, 136.

In operation, the guard is lifted out of cutting path of the mower head through a pivoting motion along the hinge 110 by the actuating member 82. The guard is lifted at an angle with respect to the path of travel of the deck and is pulled toward the center of the deck, as shown in **FIGURE 6**. The blade then extends beyond the side walls of the deck through an opening, as shown in **FIGURE 6**, and is able to cut trees, shrubs and the like.

Referring now to **FIGURES 4A** and **4B**, a second preferred embodiment of the mower head is shown. In this embodiment, like elements with the embodiment of **FIGURES 3A**

and 3B are denoted by like reference numerals with a primed ('') suffix and new components are identified by new numerals.

The mower head D of FIGURES 4A and 4B has the same features as the head shown in FIGURES 3A and 3B except that a top surface 150 of a guard 152 is located in a different plane from a top surface 102' of a deck 50'. This allows a side 54' of the deck adjacent the guard 152 to vary in shape with respect to the guard. Thus, side 54' can have an extension 154 protruding under the guard 152 and over a blade 70' thus covering more of the blade when the guard 152 is in the open position.

Referring now to FIGURES 5A and 5B, a third preferred embodiment of the mower head is shown. In this embodiment, like elements with the embodiment of FIGURES 3A and 3B are denoted by like reference numerals with a double primed (") suffix and new components are identified by new numerals. The mower head E of FIGURES 5A and 5B has the same features as the head of FIGURES 3A and 3B except a side 160 of a deck 50" has a plurality of angled sections 170, 172, 174, 176. A guard 178 also has a plurality of angled sections 180, 182, 184, 186 which matingly interconnect with the angled sections 170, 172, 174, 176 of the deck side 160. The angled portions of the deck side 160 protrude further over the top of the blade. This construction is advantageous because it provides additional shielding of the blade, as

well as preventing debris from flying up from the blade during cutting.

The invention has been described with reference to the preferred embodiments. Obviously, alterations and 5 modifications will occur to others upon a reading and understanding of this specification. It is intended to include all such modifications and alterations insofar as they come within the scope of the appended claims or the equivalents thereof.

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What is claimed is:

1. A mower head comprising:

a deck having at least three sides and at least one side wall depending from said deck;

at least one cutting blade rotatably mounted to
5 said deck on an axis extending through said deck, said deck being disposed above and generally parallel to said blade; and

a guard assembly comprising:

an actuating member mounted on said deck,

10 a guard attached to said actuating member and pivotally attached to said deck along two of said at least three sides of said deck, and

a flap which depends from said guard.

2. The mower head of claim 1 wherein said actuating member comprises a hydraulic cylinder and a piston assembly.

3. The mower head of claim 1 wherein said deck further comprises a flap depending from one of said at least three sides of said deck.

4. The mower head of claim 3 wherein said guard includes a first wall which comprises an approximately straight edge and a second wall which comprises a plurality

of angled sections.

5. The mower head of claim 4 wherein two of said deck at least three sides are normal to each other and a third of said deck at least three sides is positioned at an acute angle in relation to said two of said deck at least three sides.

6. The mower head of claim 1 further comprising a hinge for pivotally mounting said guard to said deck.

7. The mower head of claim 6 wherein said arm is mounted on said deck at a location spaced from said hinge.

8. The mower head of claim 1 wherein a top surface of said guard and a top surface of said deck are located in the same plane.

9. A mower head comprising:

a deck having at least three sides;

at least one cutting blade rotatably mounted to said deck on an axis extending through said deck, said deck being disposed above and generally parallel to said blade; and

a guard assembly comprising:

an actuating member mounted on said deck,

a hinge extending between two of said at least three sides of said deck,

a guard attached to said actuating member and pivotally attached to said deck via said hinge, and

5 a flap which depends from said guard.

10. The mower head of claim 9 wherein said actuating member comprises a hydraulic cylinder and a piston, said cylinder including a chamber surrounding said piston.

11. The mower head of claim 9 wherein one of said deck at least three sides comprises a plurality of angled sections.

12. The mower head of claim 11 wherein said guard includes a first wall which comprises a plurality of angled sections which matingly interconnect with said angled sections of said one of deck at least three sides and a second wall which comprises a plurality of angled sections.

13. The mower head of claim 9 further comprising a fourth side and at least three side walls, one depending from at least three of said four sides, wherein two of said at least three side walls are rigid.

14. The mower head of claim 13 wherein one of said three side walls of said deck comprises a flap depending from one of said four sides of said deck.

15. The mower head of claim 9 wherein a top surface of said guard and a top surface of said deck are located in the same plane.

16. The mower head of claim 9 wherein a top surface of said guard and a top surface of said deck are located in different planes.

17. The mower head of claim 16 wherein one of said at least three sides further comprises an extension which protrudes under said guard.

18. A mower head comprising:

a deck comprising:

at least four sides, and

three side walls, one depending from each of three of said at least four sides, wherein two of said three side walls are rigid;

at least one cutting blade rotatably mounted to said deck on an axis extending through said deck, said deck being disposed above and generally parallel to said blade; and

a guard assembly comprising:

an actuating member mounted on said deck,

a hinge extending between two of said at least four sides of said deck,

5 a guard attached to said pivotable arm and pivotally attached to said deck via said hinge, and

a flap which depends from said guard.

19. The mower head of claim 18 wherein said actuating member comprises a hydraulic cylinder and a piston assembly.

20. The mower head of claim 18 wherein one of said three side walls comprises a flap depending from one of said four sides of said deck.

21. The mower head of claim 18 wherein one of said deck at least four sides comprises a plurality of angled sections.

22. The mower head of claim 21 wherein said guard includes a first wall which comprises a plurality of angled sections which matingly interconnect with said angled sections of said one of deck at least four sides and a second wall which comprises a plurality of angled sections.

23. The mower head of claim 18 wherein a top surface of said guard and a top surface of said deck are located in the same plane.

24. The mower head of claim 18 wherein a top surface of said guard and a top surface of said deck are located in different planes.

25. The mower head of claim 24 wherein one of said at least four sides further comprises an extension which protrudes under said guard.

Abstract of the Invention

MOWER HEAD WITH MOVABLE GUARD

A mower head has a deck with at least three sides and at least one side wall depending from the deck. A cutting blade is rotatably mounted to the deck on an axis extending through the deck. The deck is disposed above and generally parallel to the blade. A guard assembly includes an actuating member mounted on the deck. The guard is attached to the actuating member and pivotally attached to the deck via a hinge along two sides of the deck. A flap depends from the guard. A flap also depends from one of the three sides of said deck. A top surface of the guard and a top surface of the deck can be located in the same plane. In a second embodiment, the guard includes a first wall having a plurality of angled sections which matingly interconnect with angled sections of one of the deck sides. In a third embodiment, the top surface of the guard and the top surface of the deck are located in different planes.

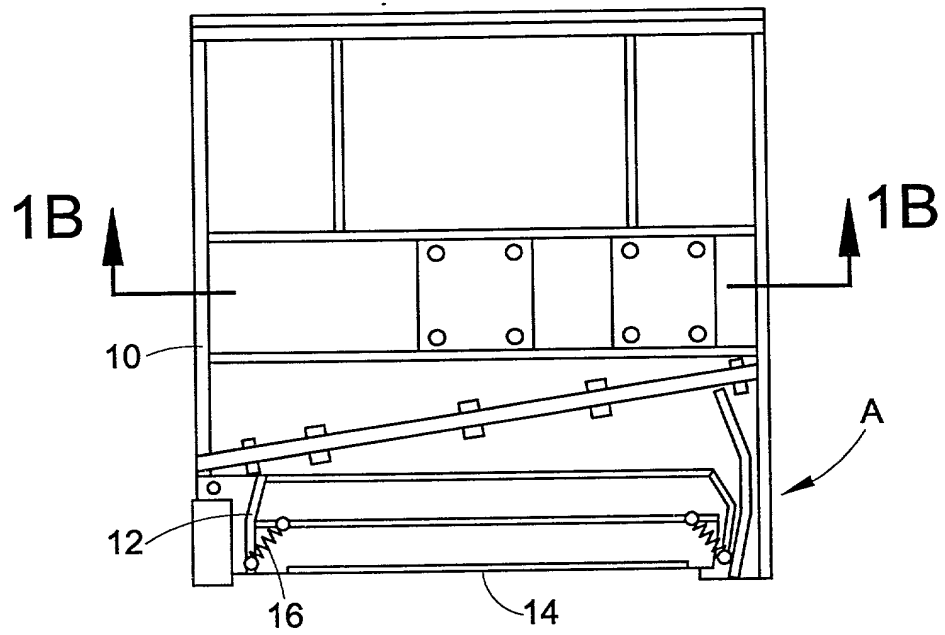


FIG. 1A
(PRIOR ART)

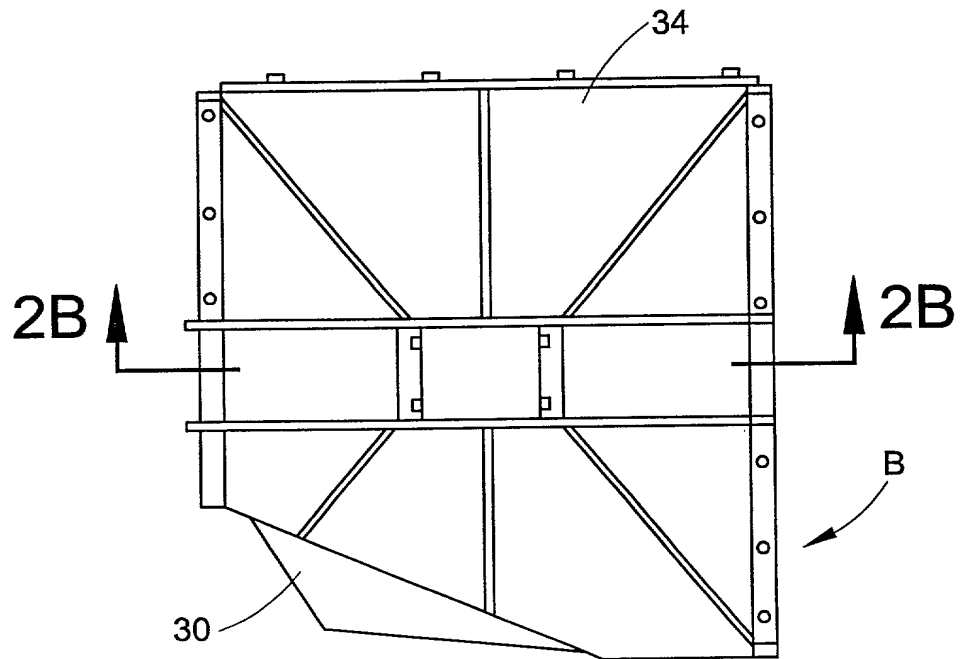


FIG. 2A
(PRIOR ART)

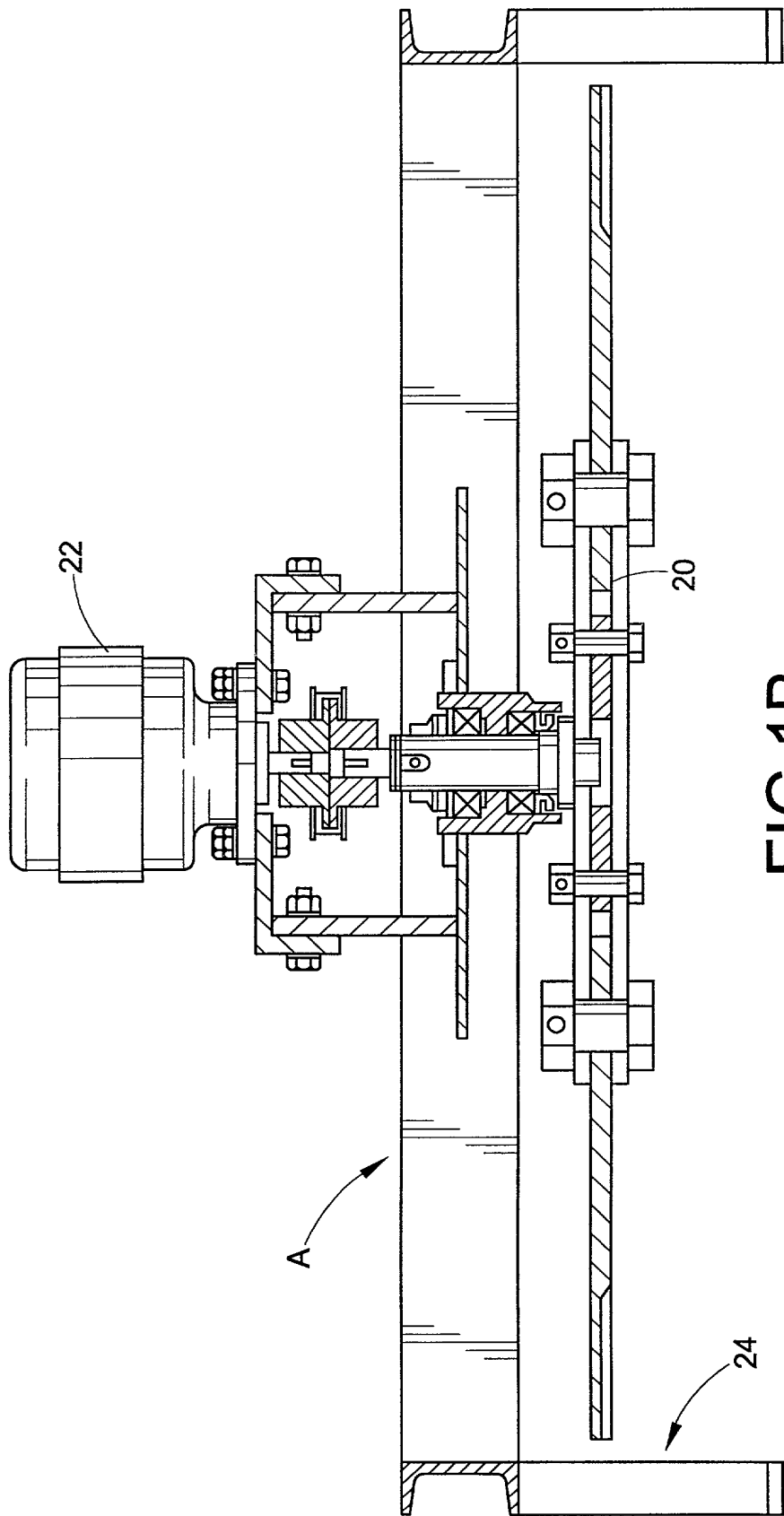


FIG.1B
(PRIOR ART)

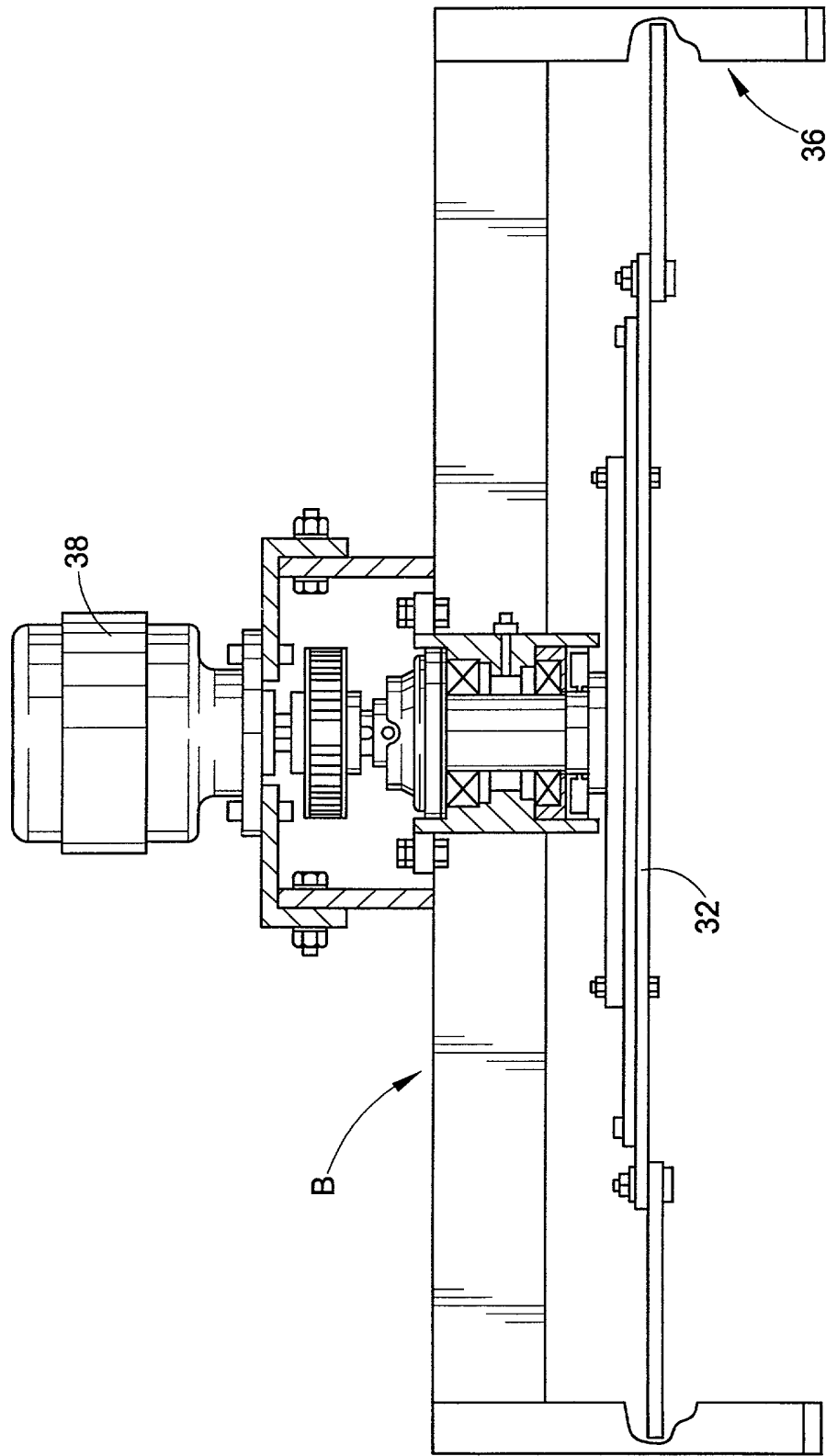


FIG.2B
(PRIOR ART)

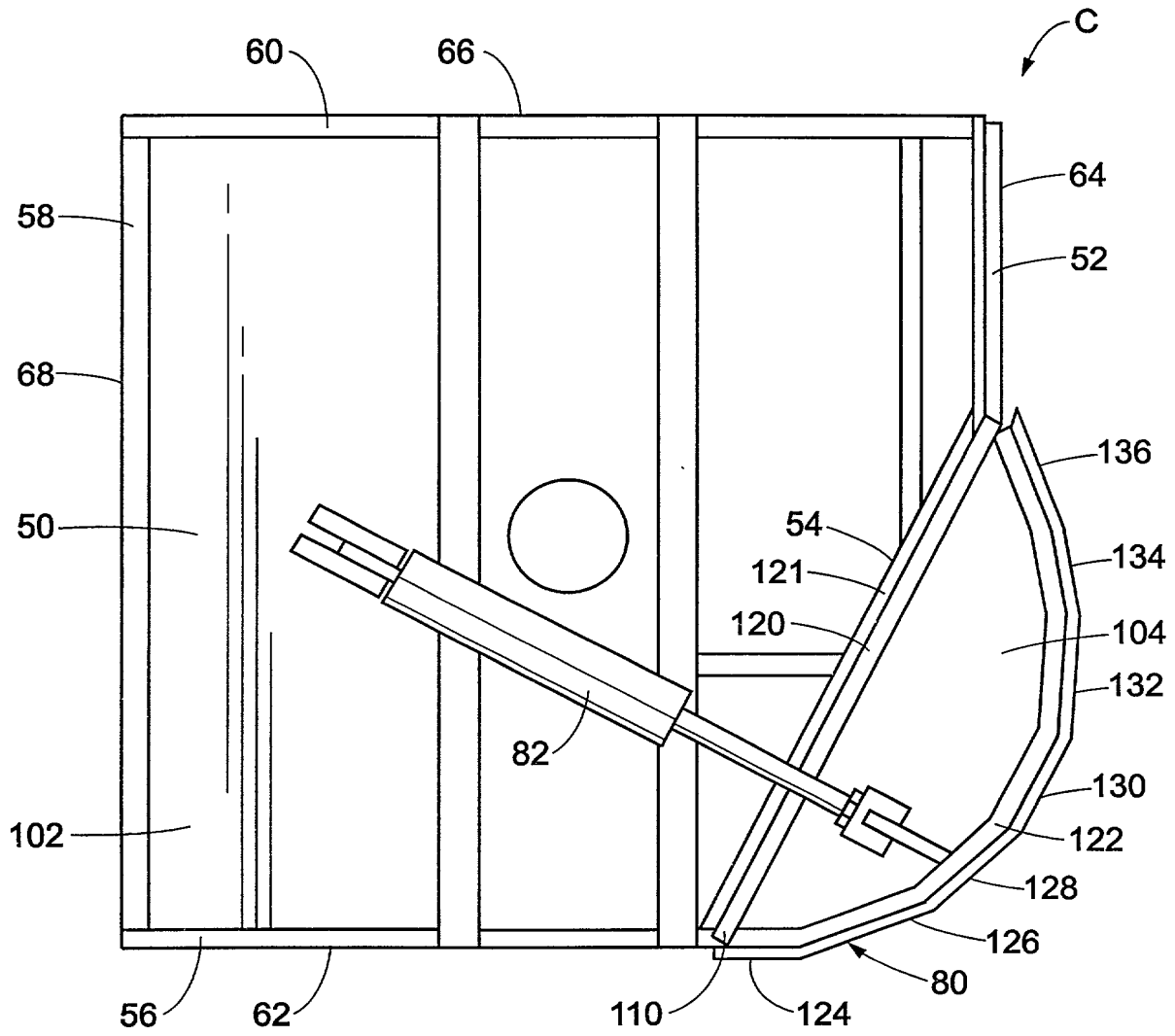


FIG. 3A

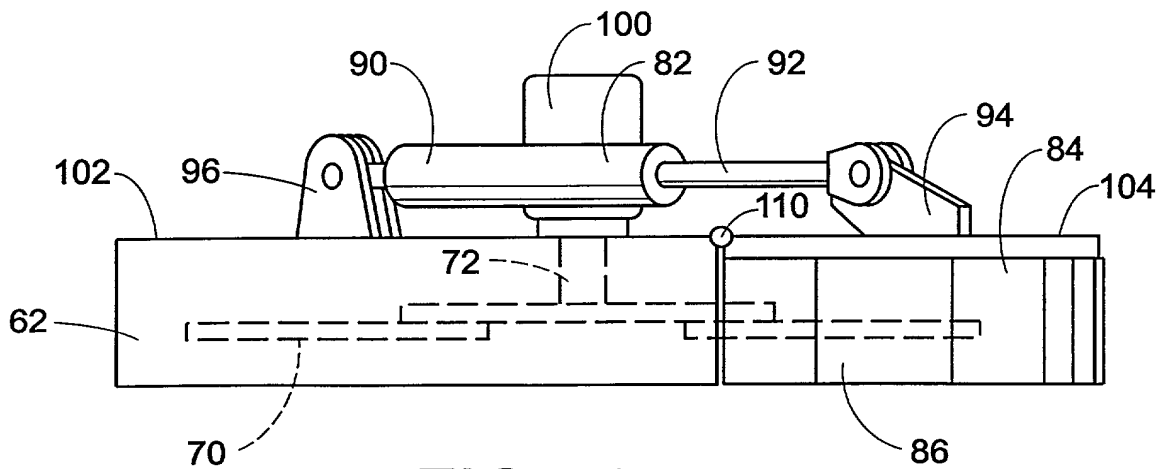


FIG. 3B

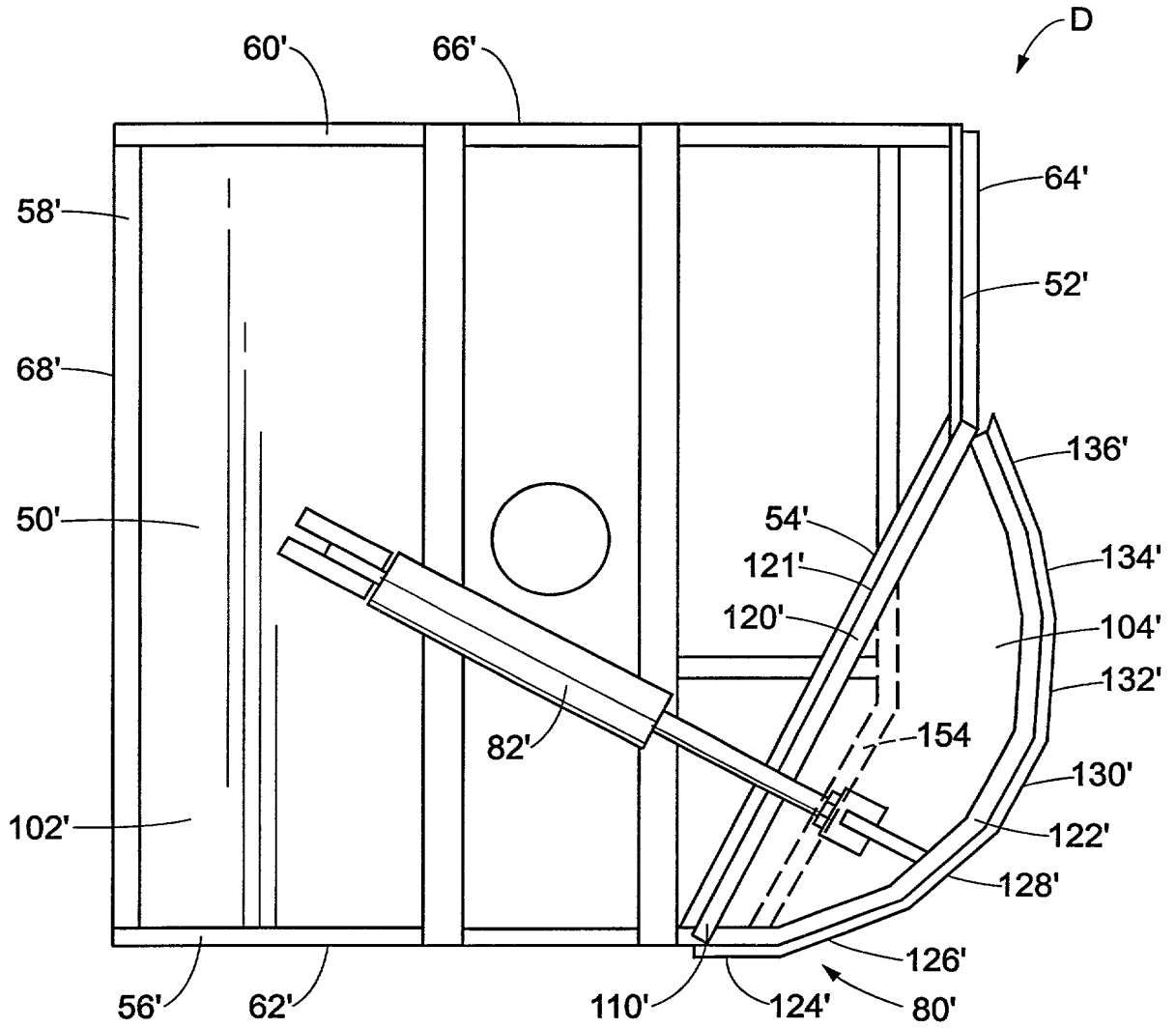


FIG. 4A

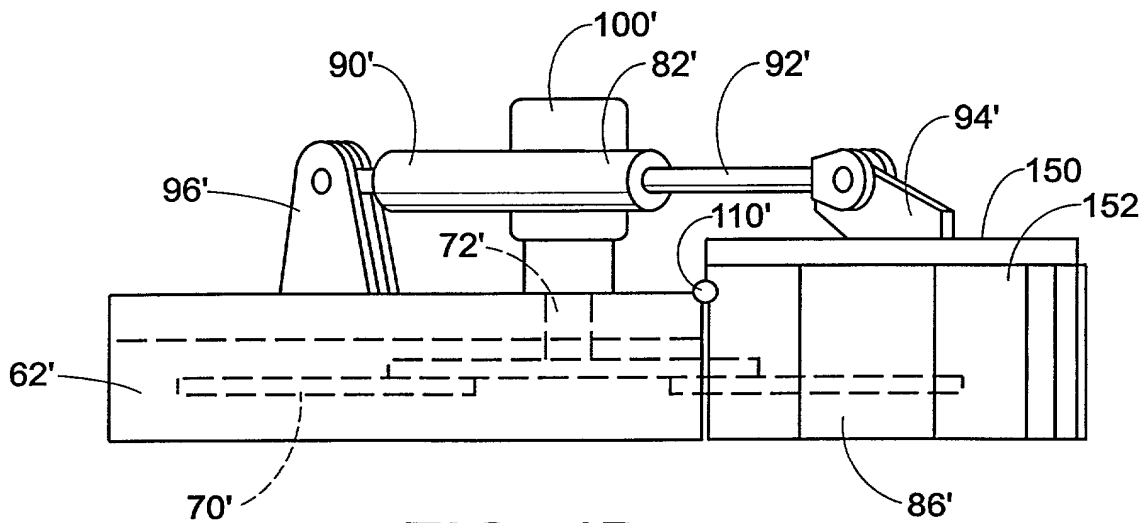


FIG. 4B

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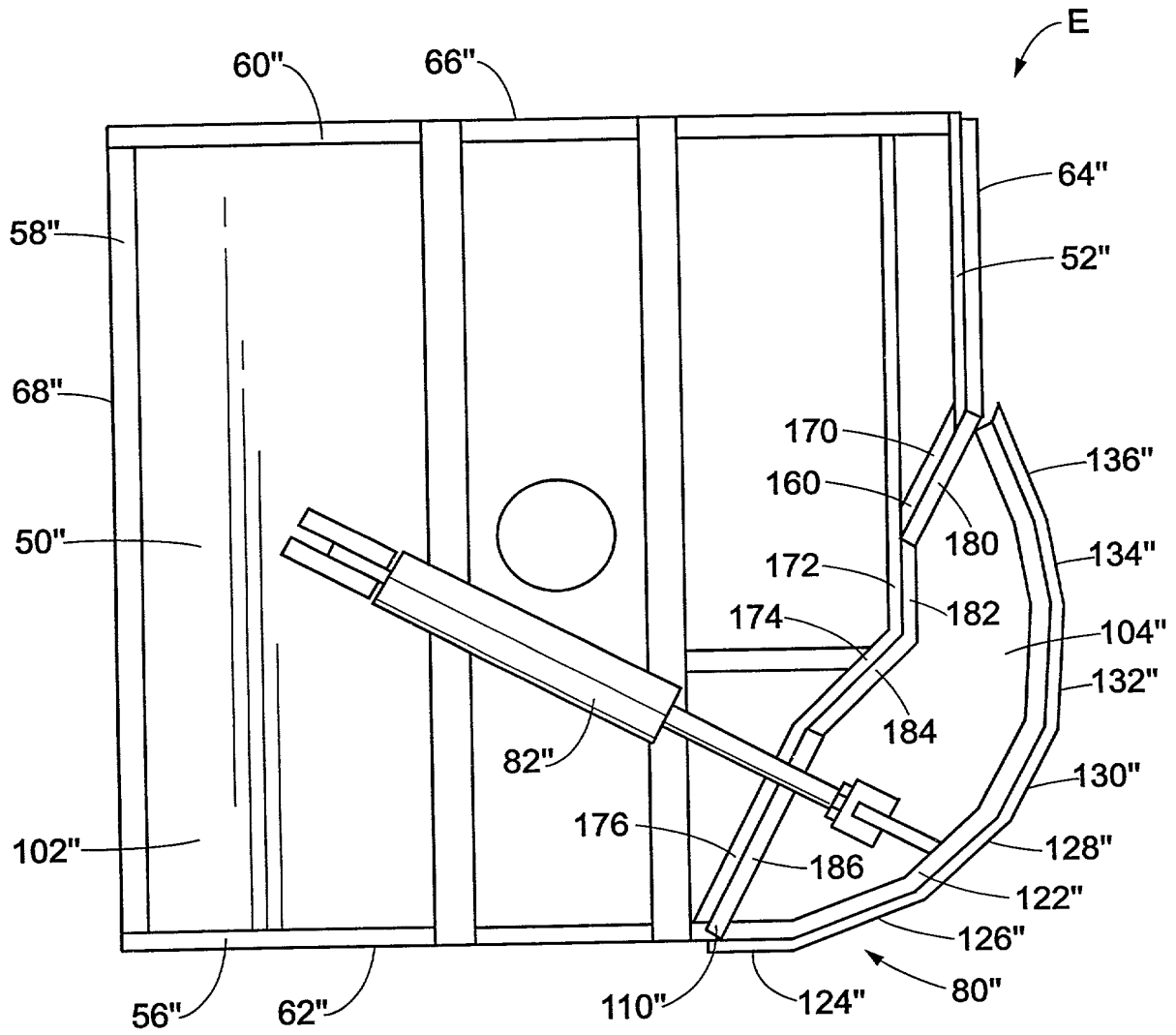


FIG. 5A

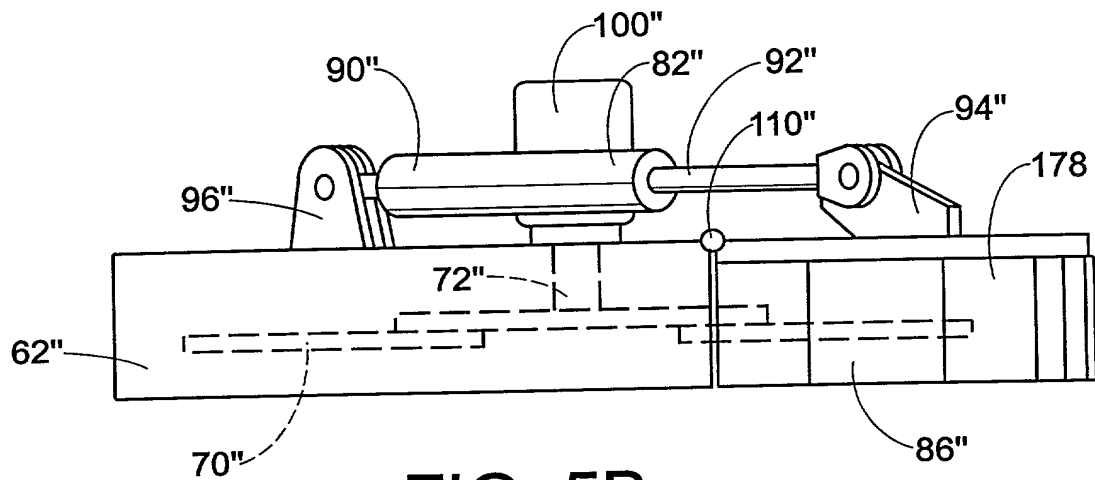


FIG. 5B

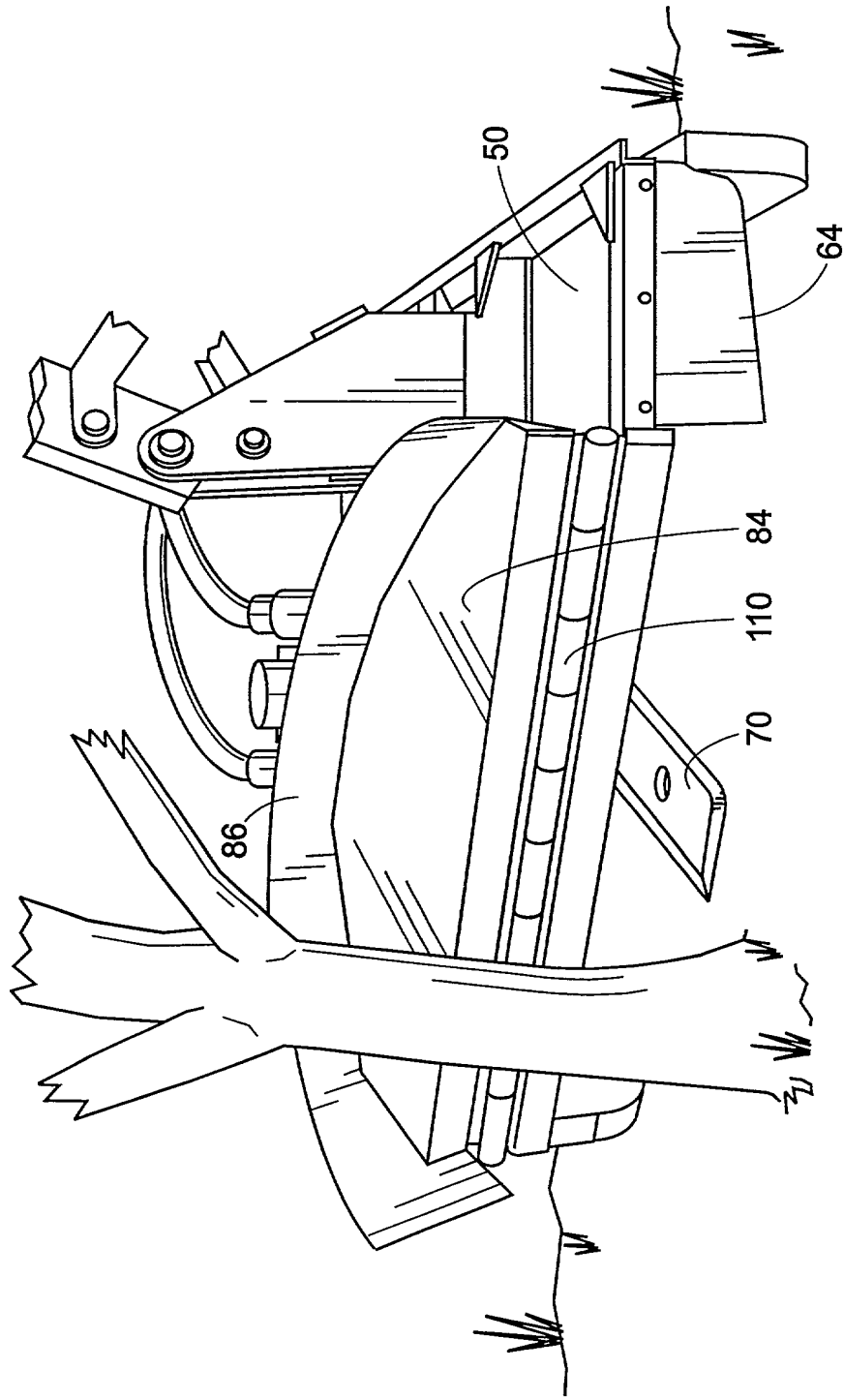


FIG. 6

DECLARATION FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am an original, first, and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

MOWER HEAD WITH MOVABLE GUARD
the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37 Code of Federal Regulations § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:
Not applicable.

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:
Not applicable.

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I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Not applicable.

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor: Jack O. Cartner

Inventor's signature 

Date: 6-1-00

Residence: Cambridge, Ohio

Citizenship: U.S.A.

Post Office Address: 1005. North 8th Street
Cambridge, Ohio 43725

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